

# GOOD CHEMICAL EDUCATION FOR GIFTED STUDENTS

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## ABSTRACT

Since 1982, an opportunity for gifted high school students to receive good chemical education has been set up by the Ministry of Education. Gifted students now can enter the chemistry department of the best university in this country through some screening activities instead of the entrance examination.

Students with chemistry score in the top 1% in their grade or good record in the National Science Work Exhibition, can be recommended by their schools to this program. There are two screening activities: (1) the National IQ test and critical thinking test, (2) one week science camp set by this Center. During the camp, students are working with university professors in the laboratory and evaluated by the same professors. The students who pass the screening activities will be recommended to the chemistry department of the university they wish to enter. There are fellowships made available by the Ministry of Education

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for such students to study in the university.

According to our follow-up study, the students selected from this program show very good academic records. More than half of students are in the top three in their class.

There are two screening activities:

1. The National IQ test and critical thinking test. The scores of both test should be more than 125.
2. Then students have to attend a one-week Science Camp set by Science Education Center, National Taiwan Normal University which sponsored by the Minister of Education. During the Camp, students are working with university professors in the laboratory and evaluated by the same professors.

Table 1 illustrates the activity schedule of science camp in chemistry developed last year. As one can see from this table, several items of the activities have been developed and used to screen the candidates:

1. Test in experimental ability and skill.
2. Creative mini experiment.
3. Research on a series of mini-scale special topics.
4. Presentation and written reports on the research of the mini-scale special topics.

The necessary chemicals and apparatus are available for both creative mini experiment and research on mini-scale special topics in the camp. Students do their experiment and research based on their idea or proposals. Professor and teaching assistant only as the observer in laboratory or give the clue of solving problems. Additional chemicals or special apparatus such as spectrophotometer, are also available to meet the individual need.

In addition to the above mentioned evaluational activities, science movies, drama, sports are also integrated into the program at night.

The records of these student were discussed and evaluated by the Committee which is set by the Ministry of Education. The members of this committee are professors in mathematics and natural sciences, admistration officers, and educational psychologists.

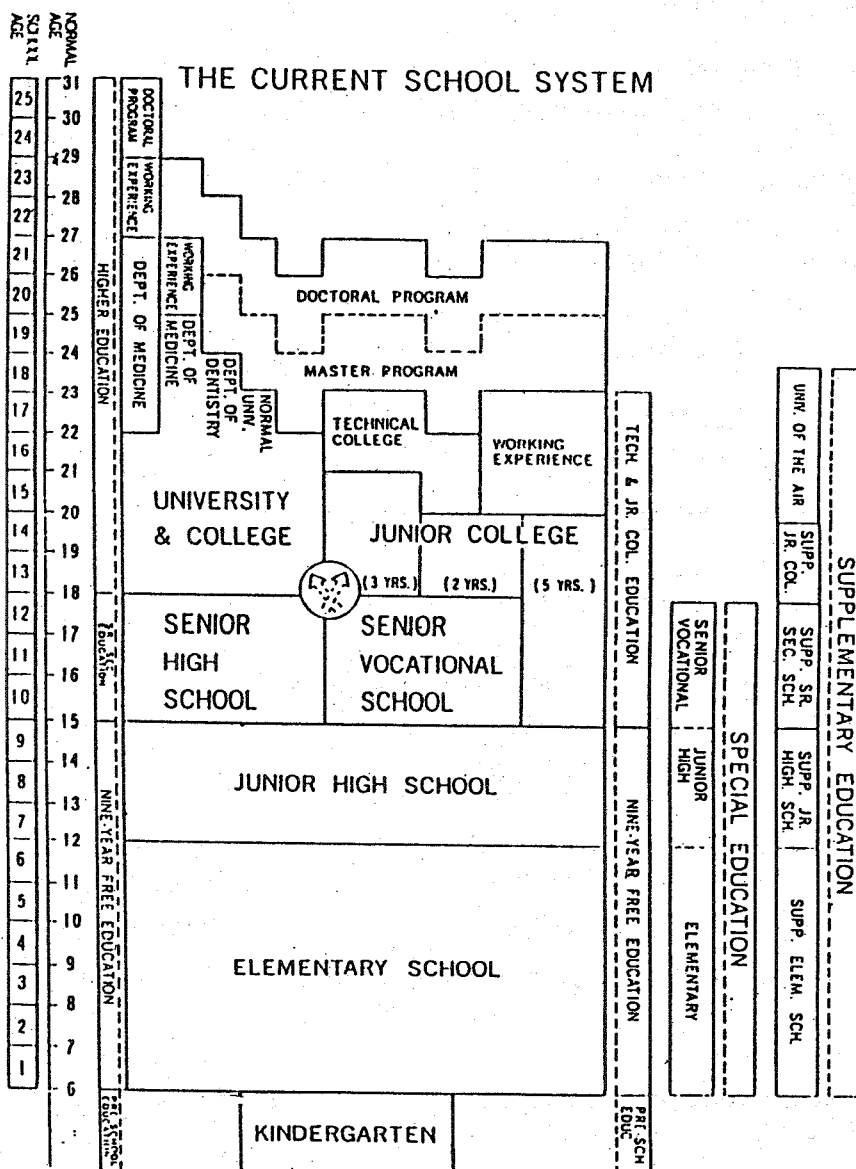


Fig 1

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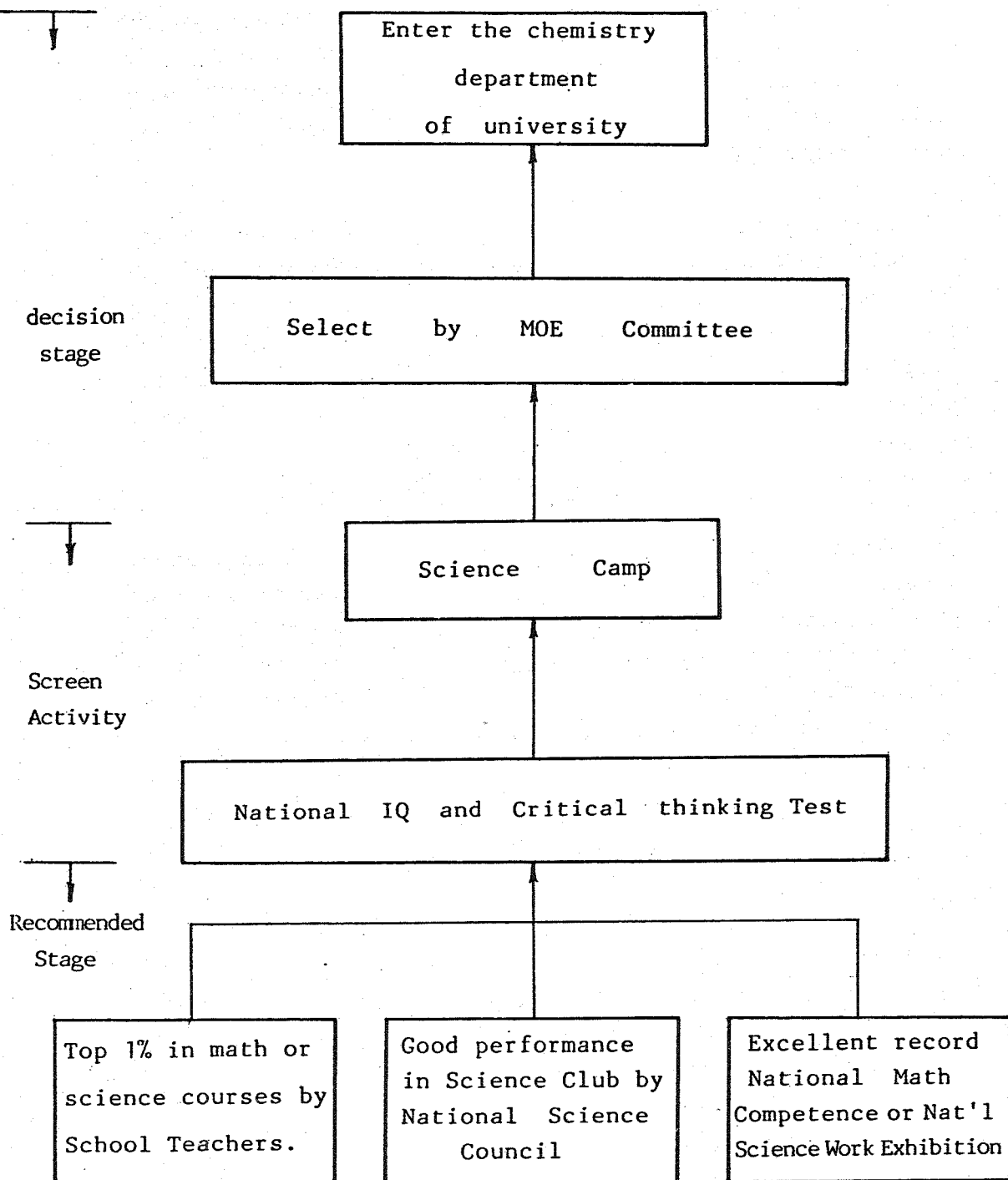


Fig 2

The Science- gifted students are the valuable potential man power to the economic development in our country. As science educators, we are more concern about how science-gifted students be identified and be fostered to develop their potentials.

According to the current school system (Fig 1) in the Republic of China, there is a nationwide university college entrance examination for senior high school graduates, and the local senior-high school entrance examination for junior high school graduates. Sum of the test scores of various subjects in the entrance examination is used to discriminate the passing or failing in the examination. It does not reveal a student's potential for science.

Since 1982, an opportunity for gifted high school students to receive good chemical education has been set up by the Ministry of Education. Gifted students now can enter the chemistry department of the best university in this country through some screening activities instead of the nationwide university college entrance examination.

The students who is in grade 12 ( the third year of senior-high school ) has to be qualified by one of the following three criteria, can be recommended by their schools to this program (Fig 2).

1. AS his record in chemistry being in the top 1% in his grade, having above average creativity and IQ, and high motivation to study chemistry. He is qualified to be recommended by his teachers.
2. He is recommended by the National Science Council, having a good performance in science club held in universities which are the Council sponsored.
3. He has excellent record in the National Science Work Exhibition.

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Table 1, Schedule of Science Camp in Chemistry

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A	08 : 10	Opening Ceremony	Creative mini experiment 1. preparation and identification of CO <sub>2</sub>	Research on a mini special topic (I) magic liquid 1. pH dependent color change	Research on a mini special topic (II)	Research Report 1. Written 2. OHP Preparation	Oral presentation of results & discussion
	09 : 00						
M	09 : 10	Special Topic Speech	2. electrolysis and formation of water 3. properties of lime water	2. Buffer Solu	Red Cabbage	Oral presentation of Results & discussion	Closing ceremony
	10 : 00						
	10 : 10						
	11 : 00						
P	11 : 10	Test in Experimental Ability					
	12 : 00						
M	1 : 10						
	2 : 00						
	2 : 10						
	3 : 00						
	3 : 10						
	4 : 00						
	4 : 10						
	5 : 00						

The students who pass the screening activities will be recommended to the chemistry department of the university such as National Taiwan University, National Tsing-hwa University and National Taiwan Normal University, they wish to enter.

Fellowships are available by the Ministry of Education for such students to study chemistry in the university.

According to our follow-up study, the students selected from this program show very good academic records. More than half of students are in the top three in their class.

They adjusted very well in their class. The term of "gifted student" was a pressure for some students in their study. But, there performance in chemistry was very satisfactorily.